



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 6505/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **GPM Resources Pty Ltd**

1.3. Property details

Property: Mining Lease 24/133
Mining Lease 24/134
Mining Lease 24/146
Mining Lease 24/348
Mining Lease 24/395
Mining Lease 24/405
Mining Lease 24/471
Mining Lease 24/532
Mining Lease 24/891
Mining Lease 24/943
Mining Lease 24/950

Local Government Area: City of Kalgoorlie-Boulder
Colloquial name: Kalgoorlie North Gold Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
240		Mechanical Removal	Mineral Production and Access Roads

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 30 April 2015

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description Beard vegetation associations have been mapped for the whole of Western Australia. One Beard vegetation association is located within the application area (GIS Database):

Beard association 2903 - Medium woodland; Salmon gum, goldfield balckbutt, gimlet & Allocasuarina cristata

A Level 1 flora and vegetation assessment was conducted over the application area by Alexander Holm & Associates (2015). Fifty nine sites were surveyed within the application area, where a total of 16 vegetation types and 9 land units with associated vegetation communities were identified;

Vegetation types

Vegetation Code	Vegetation Type	On Land Unit(s)
GHMW	Greenstone hill mixed woodland	1a, 2a and 2b
GEHW	Greenstone eucalypt halophyte woodland*	2b
PECW	Plain eucalypt chenopod woodland on	4a
PEXW	Plain eucalypt eremophila – chenopod woodland	6a
PXHS	Plain mixed halophyte shrubland	2b and 4a
BRXS	Breakaway mixed shrubland	2a
PESW	Plain eucalypt saltbush woodland	6a
DRXT	Drainage mixed thicket	7
PEEW	Plain eucalypt eremophila woodland	1a
GHAS	Greenstone hill acacia shrubland	1b
SIAS	Stony ironstone acacia shrubland	2a

PEBW	Plain eucalypt bluebush woodland	4a
SGRS	Sandy granitic acacia shrubland	3
GNEW	Greenstone hill (non-halophytic) eucalypt woodland	1b and 2b
PEAW	Plain eucalypt acacia woodland	2a and 6a
BXSW	Breakaway mixed shrubland woodland*	1b

Land units

Land Unit	Land Unit description	Vegetation Community
1a	Low hills, occasional minor breakaways and stony uplands on felsic rocks	Scattered to moderately close (PFC 15 – 30%), mixed height shrublands dominated by <i>Acacia quadrimarginea</i> , <i>Acacia incurvaneua</i> , <i>A. burkittii</i> , <i>Dodonaea lobulata</i> , <i>Alyxia buxifolia</i> , <i>Eremophila</i> spp. and <i>Melaleuca</i> sp. With emergent small trees of <i>Casuarina obesa</i> . (GHAS)** Scattered to moderately close (PFC 15 – 40%), mixed height shrublands dominated by <i>Eremophila</i> spp. including <i>E. sp. Mt Jackson</i> , <i>E. oppositifolia</i> subsp. <i>angustifolia</i> and <i>E. oldfieldii</i> subsp. <i>angustifolia</i> , <i>Dodonaea lobulata</i> and other <i>D. spp.</i> <i>Acacia erinaceae</i> and <i>Ptilotus obovatus</i> . with isolated trees of <i>Casuarina obesa Eucalyptus transcontinentalis</i> and other <i>Eucalyptus</i> sp. (GHMW, less frequently BRXS).
1b	Low hills on mafic or ultra mafic metamorphosed rocks	Vegetation consists of woodlands or shrublands. Woodlands (6 - 14 m) are very scattered (PFC 1 – 3%) and dominated by <i>Eucalyptus clelandii</i> , <i>E. griffithsii</i> other <i>Eucalyptus</i> spp. and <i>Casuarina obesa</i> with scattered (PFC 10 – 15%) undershrubs dominated by <i>Senna artemisioides</i> ssp. <i>filifolia</i> , <i>Scaevola spinescens</i> , <i>Acacia erinacea</i> , <i>Eremophila</i> spp. <i>Dodonaea lobulata</i> , and <i>Ptilotus obovatus</i> .(GNEW). Shrublands (to 5 m) are scattered to moderately close (PFC 15 – 25%) and dominated by <i>Acacia burkittii</i> , <i>A. quadrimarginea</i> , <i>Dodonaea lobulata</i> , <i>Scaevola spinescens</i> and <i>Senna artemisioides</i> spp. <i>filifolia</i> sometimes with isolated emergent eucalypt or <i>Casuarina obesa</i> small trees. (GHAS). Infrequently other vegetation types, (GHMW, BXSW).
2a	Low rises, occasional minor breakaways and gently undulating plains on laterite	Vegetation is predominantly scattered to moderately close (PFC 10 – 30%) shrublands to 4 m dominated by <i>Acacia burkittii</i> , <i>A. quadrimarginea</i> , <i>A. tetragonophylla</i> , <i>Senna artemisioides</i> ssp. <i>filifolia</i> , <i>Scaevola spinescens</i> , <i>Dodonaea lobulata</i> , <i>Eremophila</i> spp. And <i>Ptilotus obovatus</i> often with isolated emergent small eucalypt or <i>Casuarina obesa</i> trees. (GHMW, SIAS). Upper duricrust/minor breakaway sites support isolated to moderately close (PFC <2.5 – 30%) mixed shrublands (to 2 m) co-dominated by <i>Acacia erinacea</i> , <i>Grevillea acuaria</i> and sitespecific species such as <i>Melaleuca lateriflora</i> , <i>Dodonaea stenozyga</i> , <i>Phebalium filifolium</i> , <i>Cryptandra graniticola</i> , <i>Westringia</i> spp. And <i>Ptilotus helichrysoides</i> with emergent small eucalypt and <i>Casuarina obesa</i> trees (BRXS).
2b	Low rises and gently undulating plains on basalt or metamorphosed rocks	Woodlands (5 – 12 m) are very scattered (PFC 2 – 5%) dominated by <i>Eucalyptus clelandii</i> , <i>E. graceless</i> , <i>Eucalyptus yilgarnensis</i> and other <i>Eucalyptus</i> spp. with scattered (PFC 10 - 25%) understoreys dominated by <i>Atriplex nummularia</i> , <i>Maireana</i> spp, <i>Senna artemisioides</i> spp. <i>filifolia</i> , <i>Dodonaea lobulata</i> , <i>Eremophila scorparia</i> and other species, <i>Scaevola spinescens</i> and <i>Ptilotus obovatus</i> . (GEHW, PECW). Shrublands (to 3 – 4 m) are scattered to moderately close (PFC 15 - 30%) and dominated by <i>Acacia burkittii</i> , <i>A. hemiteles</i> , <i>A. quadrimarginea</i> , <i>A. erinacea</i> , <i>Casuarina obesa</i> , <i>Senna artemisioides</i> ssp. <i>filifolia</i> , <i>Scaevola spinescens</i> and <i>Eremophila</i> spp. (GHAS, CEAS, SCJS). Hummock grasslands (<i>Triodia irritans</i>) (PFC 15-25%) with very scattered (PFC 5%) <i>Eucalyptus griffithsii</i> , <i>E. oleosa</i> spp. <i>oleosa</i> and <i>E. yilgarnensis</i> (5 10 m) with scattered (PFC 5-15%) undershrubs including <i>Dodonaea stenozyga</i> , <i>Eremophila parvifolia</i> subsp. <i>auricampa</i> and <i>Westringia rigida</i> . (GEHS)
3	Stony plains on granitoid rocks	Moderately close (PFC 20 – 30%) mixed height (0.3 – 4 m) shrublands dominated by <i>Senna artemisioides</i> ssp. <i>filifolia</i> , <i>Acacia kalgooliensis</i> , other acacias, <i>Eremophila</i> spp., <i>Maireana triptera</i> and numerous other low shrubs; sometimes with isolated emergent small trees such as <i>Eucalyptus griffithsii</i> (SGRS).
4a	Loamy plains with eucalypt woodlands	Predominantly very scattered (PFC 1 – 5%) woodlands (5 – 20 m) frequently dominated by <i>Eucalyptus salmonophloia</i> , less common dominants or co-dominants are <i>E. ravida</i> , <i>E. transcontinentalis</i> , <i>E. gracilis</i> and <i>Casuarina obesa</i> . Scattered to moderately close (PFC 5 – 30%) understoreys dominated by halophytic species such as <i>Atriplex bunburyana</i> , <i>A. nummularia</i> , <i>Maireana sedifolia</i> , <i>M. pyramidata</i> , <i>M. georgei</i> , <i>M. triptera</i> and <i>Frankenia interioris</i> var. <i>interioris</i> ; other common shrubs are <i>Senna artemisioides</i> ssp. <i>filifolia</i> , <i>Eremophila scorparia</i> , <i>E. interstans</i> subsp. <i>interstans</i> and <i>Ptilotus obovatus</i> . (PECW, PEBW, PESW, PEXW, PXHS). Less frequently understoreys have fewer or no halophytes and are dominated by <i>Senna artemisioides</i> ssp. <i>filifolia</i> , <i>Dodonaea lobulata</i> , <i>Eremophila</i> sp. Mt Jackson, other <i>Eremophila</i> sp., <i>Scaevola spinescens</i> , <i>Ptilotus obovatus</i> and occasionally <i>Acacia burkittii</i> . (PEAW, PEEW).
6a	Drainage tracts with shrublands or sparse woodlands	Shrublands or sparse woodlands. Shrublands are low (<1m), very scattered to moderately close (PFC 5 – 30%) and dominated by <i>Atriplex bunburyana</i> , <i>A. nummularia</i> , <i>Maireana pyramidata</i> and other <i>Maireana</i> spp. (PXHS, PSAS). Also scattered to close (PFC 10 – 70%) tall shrublands (to 4 m) dominated by <i>Eremophila scoparia</i> , <i>E. oldfieldii</i> , <i>Acacia burkittii</i> <i>A. erinacea</i> and <i>Ptilotus obovatus</i> with isolated emergent small eucalyptus and <i>Casuarina obesa</i> trees. Woodlands (4 - 15 m) are very scattered (PFC 2– 3%) and dominated by <i>Casuarina obesa</i> , <i>Eucalyptus salmonophloia</i> , <i>E. ravida</i> and other <i>Eucalyptus</i> spp. with very scattered to close (PFC 5 – 40%) shrub layers dominated by <i>Atriplex bunburyana</i> , <i>Maireana pyramidata</i> , other <i>M. spp.</i> , <i>Scleroleana</i> spp., <i>Eremophila</i> spp. And <i>Ptilotus obovatus</i> . (PECW, PESW, PEAW).
7	Groves/drainage foci	Vegetation is closed (PFC 50 – 100%) woodlands (10 - 15 m) dominated by <i>Eucalyptus ravida</i> , <i>E. salmonophloia</i> , <i>E. gracilis</i> and <i>E. griffithsii</i> with very few under shrubs such as <i>Senna artemisioides</i> , <i>Dodonaea lobulata</i> , <i>Acacia erinacea</i> and <i>Pimelia microcephala</i> or closed (PFC>50%) under shrubs of <i>Acacia burkittii</i> (to 4m).(DRXT). Also closed (PFC 50 – 100%) <i>Acacia burkittii</i> thickets (to 5 m) with emergent eucalypt trees.(DRXT).

Note: Not all vegetation types mentioned in the vegetation communities were identified in survey sites within the application area (e.g. DRXT).

Clearing Description	Kalgoorlie North Gold Project. GPM Resources Pty Ltd proposes to clear up to 240 hectares of native vegetation within a total boundary of approximately 2952 hectares, for the purpose of mineral production and access roads. The project is located approximately 50 kilometres north of Kalgoorlie-Boulder, in the City of Kalgoorlie-Boulder.
Vegetation Condition	The majority of the application area appears to be in a “Good “to “Excellent” condition. The application area is within a pastoral lease and has been grazed by livestock and feral animals. Tracks and grid lines cross parts of the application area and there are historic and more recent mining disturbances including mine shafts, pits and waste rock landforms. These areas are considered to be in a ‘Degraded ‘to’ Completely Degraded’ condition (Alexander Holm & Associates, 2015). Good : Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery, 1994); To: Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994).
Comment	The vegetation condition was derived from aerial imagery and a report prepared by Alexander Holm & Associates (2015).

3. Assessment of application against clearing principles

(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

Comments	<p>Proposal may be at variance to this Principle</p> <p>The application area lies within the Murchison Interim Biogeographic Regionalisation of Australia (IBRA) and the East Murchison subregion (GIS Database) which is characterised by its internal drainage, extensive areas of elevated red desert sandplains with minimal dune development and an arid climate (CALM, 2002). Broad plains of red-brown soils and breakaway complexes as well as red sandplains feature and vegetation is dominated by Mulga Woodlands often rich in ephemerals; hummock grasslands, saltbush shrublands and Halosarcia shrublands (CALM, 2002). The subregion is rich and diverse in both its flora and fauna; however most species are wide ranging and usually occur in at least one, and often several, adjoining subregions (CALM, 2002).</p> <p>The survey area lies on the northern edge of the Great Western Woodlands, a large tract of Eucalypt Woodland extending from the Wheatbelt to the inland deserts of Western Australia (Watson <i>et al.</i>, 2008). The Great Western Woodlands is the largest remaining intact temperate woodland in the world, is one of the very few, large, intact landscapes remaining in temperate Australia and is of Global significance (DEC, 2010).</p> <p>A flora and vegetation survey conducted by Alexander Holm & Associates (2015) surveyed 160 sites, fifty nine of which were in the application area. A total of 289 flora taxa representing 26 families were recorded in the wider survey area. Sixteen dominant vegetation types were identified within the application area. The condition of the vegetation varies, but appears to be in a predominantly ‘Good’ to ‘Excellent’ condition (GIS Database; Alexander and Associates, 2015).</p> <p>Four Priority 1 flora species have been recorded in the local area (40 kilometre radius); <i>Acacia epedunculata</i>, <i>Eremophila praecox</i>, <i>Ptilotus chortophytus</i> and <i>Ptilotus rigidus</i>. The only species recorded within 10 kilometres of the application area is <i>Acacia epedunculata</i>, which prefers soil types absent from the application area (DpaW, 2015a). The remaining three Priority 1 flora species were not recorded in any of the fifty nine sites surveyed during the flora survey.</p> <p>One Priority 3 flora species was recorded during a traverse of the application area; <i>Allocasuarina eriochlamys</i> subsp. <i>grossa</i>. A solitary plant was observed. This species occurs on red sand, stony and gravelly soils and rocky outcrops. Given that this is a relatively widespread species that has been recorded across three IBRA subregions (DPaW 2015a); the proposed clearing is unlikely to affect the continued existence of this species at a community or population level.</p> <p>There are no known Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs) mapped within the application area (GIS Database). During a flora and vegetation survey, no TECs or PECs were recorded within the application area (Alexander Holm & Associates, 2015).</p> <p>The majority of the vegetation and habitat types present within the application area are not considered to be representative of an area of high diversity and are well represented throughout the region, however, low breakaways and lateritic duricrust surfaces within land units 1a, 1b and 2a support regionally-restricted and moderately-diverse flora as characterised by the vegetation community BRXS (breakaway mixed shrubland) (Alexander Holm and Associates 2015). There are at least 7 locations within the application area where ridges have been recorded.</p> <p>In addition to the restricted vegetation communities, two significant Vegetation and Substrate Associations (VSAs) were identified during the level 1 fauna survey (Orell <i>et al.</i> 2012);</p> <ol style="list-style-type: none"> 1) Ironstone ridges with <i>Acacia</i> spp. (including <i>Acacia aneura</i>), <i>Grevillea nematophylla</i> and areas of <i>Casuarina pauper</i> and Eucalypt Woodland; and
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- 2) Greenstone hills, stony rises and rocky ridges supporting Eucalypt Woodlands, with Acacia shrubland and *Casuarina pauper*

These VSAs are likely to support restricted fauna assemblages, including Short Range Endemic (SRE) invertebrate species (Orell *et al.* 2012). Ironstone ridges are associated with the vegetation community BRXS and will not be disturbed by the proposed clearing and the proponent has committed to the implementation of an environmental management plan. Greenstone hills are a common feature of the local area and throughout the clearing envelope (Alexander Holm and Associates 2015; A Holm 2015, pers comm., 20 April).

The presence of creeks, drainage lines and groves within the application area, may also provide suitable habitat for SRE species (Orell *et al.* 2012). The proposed mining footprint and disturbance area for access roads has been designed to avoid areas where groves persist and the proponent has committed to minimising disturbance to these areas within its environmental management plan. Creeks and drainage lines are common throughout the local area (Alexander Holm and Associates 2015; A Holm 2015, pers comm., 20 April). Potential impacts to restricted vegetation and fauna assemblages as a result of the proposed clearing may be minimised by the implementation of a restricted clearing condition.

Twenty two introduced (weed) species were located during the flora and vegetation survey. Of these species *Carthamus lanatus* (Saffron thistle) is a declared plant (P1) under the *Agriculture and Related Resources Protection Act 1976* (Agricultural Protection Authority 2011). Weeds have the potential to significantly change the dynamics of a natural ecosystem and lower the biodiversity of an area. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

Based on the above, the proposed clearing may be at variance to this Principle.

Methodology Alexander Holm & Associates (2015)
CALM (2002)
DEC (2010)
DPaW (2015a)
Orell *et al.* (2012)
GIS Database:
- IBRA WA (Regions - Sub Regions)
- Pre-European vegetation
- Threatened Ecological Sites Buffered

(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.

Comments Proposal is at variance to this Principle

A level 1 fauna survey (desktop review and reconnaissance survey) was carried out over the application area and also surveyed a number of other tenements outside the proposed clearing envelope. The total area surveyed covered an area approximately four kilometres wide by twenty five kilometres long. The survey area was visited on 20 and 21 of March 2012 and included several components including targeted searching for conservation significant fauna species, a bird census, bat surveys, the use of motion-sensitive camera's, opportunistic fauna survey sites, habitat assessment and opportunistic observations (Orell *et al.* 2012). A total of 63 fauna species were recorded during the reconnaissance field survey. This comprised six reptile, 45 bird, five native mammal and five introduced mammal species.

A total of six Vegetation and Substrate Associations (VSAs) were identified during the reconnaissance survey of the application area and surrounding tenements (Orell *et al.* 2012):

- 1) Ironstone ridges with Acacia spp. (including *Acacia aneura*), *Grevillea nematophylla* and areas of *Casuarina pauper* and Eucalypt Woodland;
- 2) Greenstone hills, stony rises and rocky ridges supporting Eucalypt Woodlands, with Acacia shrubland and *Casuarina pauper*;
- 3) Stony lower slopes and adjacent stony plains supporting Eucalypt Woodlands – particularly *E. lesouefii* and mixed chenopod and *Eremophila* spp. shrublands;
- 4) Drainage tracts with mixed Eucalypts including *Eucalyptus salmonophloia*, *E. salubris* woodlands on clay flats;
- 5) Loam plains supporting Open Salmon Gum (*Eucalyptus salmonophloia*) Woodland; and
- 6) Clay / Loam flats supporting Mixed Eucalypt Woodland and chenopod shrublands

Of the six VSAs identified during the reconnaissance survey of the application and surrounding tenements, two are considered significant as habitat for fauna (Orell *et al.* 2012):

- 1) Ironstone ridges with Acacia spp. (including *Acacia aneura*), *Grevillea nematophylla* and areas of *Casuarina pauper* and Eucalypt Woodland;
- 2) Greenstone hills, stony rises and rocky ridges supporting Eucalypt Woodlands, with Acacia shrubland and *Casuarina pauper*

Ironstone ridges are restricted in the region and often occur in small isolated areas. Most ridges contain areas of outcropping with some small breakaway areas containing caves (Orell *et al.* 2012). Ironstone ridges are

likely to support locally significant species and restricted fauna assemblages, including Short Range Endemic (SRE) species (Orell *et al.* 2012). Greenstone hills are widespread in the region but have a restricted occurrence. Greenstone hills may also support locally significant species, species of conservational significance and possibly SRE species (Orell *et al.* 2012). The presence of creeks, drainage lines and groves within the application area, may also provide potentially suitable habitat for SRE invertebrate species. Potential impacts to restricted fauna habitats and assemblages (that may support conservation significant fauna species) as a result of the proposed clearing, may be minimised by the implementation of restricted clearing condition. The clearing of mature eucalypt trees should also be restricted where possible, as these may support conservation significant fauna. The proponent has committed to minimising disturbance to mature eucalypt trees within their environmental management plan.

Based on habitat type and fauna surveys in the local area, the following species of conservation significance listed as either threatened species under the *Environment Protection and Biodiversity Conservation Act (EPBC) 1999* or protected under Western Australian legislation (*Wildlife Conservation Act 1950 (WC)*) are likely to occur within the application area (DPaW 2014; Orell *et al.* 2012):

- Carpet Python (*Morelia spilota* – WC Act Schedule 4,);
- Malleefowl (*Leipoa ocellata* –WC Act Schedule 1, EPBC Act Vulnerable);
- Peregrine Falcon (*Falco peregrinus* – WC Act Schedule 4);
- Major Mitchell's Cockatoo (*Cacatua leadbeateri* – WC Act Schedule 4);
- Rainbow Bee-eater (*Merops ornatus* - Migratory);
- Fork-tailed Swift – (*Apus pacificus* – Migratory);
- Great Egret (*Ardea modesta* – Migratory);
- Chuditch (*Dasyurus geoffroii* – (WC Act Vulnerable, EPBC Act Threatened (Vulnerable));
- Arid Bronze Azure (*Ogyris subterrestris petrina* – WC Act Critically Endangered, EPBC Act Critically Endangered);and
- Bilby, *Dalgyte* (*Macrotis lagotis* – WC Act Vulnerable, EPBC Act Vulnerable)

There are also a number of Priority listed species (recognised by DPaW as being of conservation significance) that are likely to occur within the application area;

- Western Rosella (*Platycercus icterotis xanthogenys* – Priority 4);
- Australian Bustard (*Ardeotis australis* – Priority 4);
- Crested Shrike-tit (*Falcunculus frontatus* – Priority 4);
- Shy Heathwren (*Hylacola cauta whitlocki* - Priority 4);
- Central Long-eared Bat (*Nyctophilus timoriensis* – Priority 4);
- Tree-stem Trapdoor Spider (*Aganippe castellum* – Priority 4);and
- Inland Hairstreak Butterfly (*Jalmenus aridus* – Priority 1)

The Carpet Python may be present anywhere there is dense vegetation and is often found in eucalypt woodlands (DPaW, 2015b). None were observed during the reconnaissance survey and there are large amounts of suitable habitat remaining in the local area. The proponent has committed to minimising impacts to this species within their environmental management plan and will inspect habitat trees and capture and relocate fauna if required.

Three moribund malleefowl nests were located during the flora and vegetation survey (Alexander Holm and Associates, 2015); however targeted searching did not locate any evidence of the Malleefowl or Arid Bronze Azure Butterfly (Orell *et al.* 2012). To further reduce potential impacts to Malleefowl, the proponent has committed to inspecting areas intended for clearing for the presence of any active malleefowl mounds.

Given the amount of suitable habitat remaining within the local area, the proposed clearing is not likely to significantly impact the Peregrine Falcon, Inland Western Rosella, Major Mitchells Cockatoo or the Central Long-eared Bat. No avian species known from the local area are likely to be impacted by the proposed clearing, as they are either widespread or irregular visitors to the application area (Orell *et al.* 2012).

Highly mobile species that are known to occur in a variety of habitats such as the Chuditch and the Bilby (DoE, 2015b; Orell *et al.* 2012) are unlikely to be impacted by the proposed clearing.

The nearest recorded occurrence of the Tree-stem Trapdoor Spider is more than 100 kilometres from the application area, where the Tree-stem Trapdoor Spider appears to be widespread along the slopes of the hills in the region (Orell *et al.* 2012). Even though potential habitat does occur within the application area, this species is not known from the area and no burrows were recorded during the reconnaissance survey (Orell *et al.* 2012).

The larval food plants for the Inland Hairstreak Butterfly (*Acacia tetragonophylla* and *Senna nemophila*) (Sands and New, 2002) were not identified within the application area during the flora and vegetation survey; therefore this species is unlikely to reside within the application area.

Given that parts of the application area contain restricted and/or significant fauna habitat, the vegetation under application is considered to be comprised of significant habitat for fauna indigenous to Western Australia.

Based on the above, the proposed clearing is at variance to this Principle

Methodology Alexander Holm and Associates (2015)
DoE (2015a)
DoE (2015b)
DoE (2015c)
DPaW (2014)
DPaW (2015b)
Orell et al. (2012)
Sands and New (2002)

(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.

Comments Proposal is not likely to be at variance to this Principle

According to available databases, there are no known records of Threatened Flora within the application area (GIS Database). A search of the Department of Parks and Wildlife's Threatened and Priority Flora databases identified no Threatened Flora species as occurring within a 40 kilometre radius of the application area (DPaW, 2014).

A Level 1 flora and vegetation assessment was conducted over the application area over two years. Northern and central areas were surveyed from 13 to 27 April 2012, Southern areas were surveyed from 31 July to 5 August 2012 and remaining areas were surveyed from 17 to 19 November 2014 (Alexander Holm & Associates, 2015). No Threatened Flora species were identified within the application area.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology DPaW (2014)
Alexander Holm & Associates (2015)
GIS Database
- Threatened and Priority Flora List

(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.

Comments Proposal is not at variance to this Principle

According to available datasets, there are no Threatened Ecological Communities (TECs) within the application area. No TECs were identified during a level 1 flora and vegetation survey of the local area, which also included the application area (Alexander Holm & Associates, 2015) and there are no known TECs within the bioregion (GIS Database; Alexander Holm & Associates, 2015).

Based on the above, the proposed clearing is not at variance to this Principle.

Methodology Alexander Holm and Associates (2015)
GIS Database:
- Threatened Ecological Sites Buffered
- Threatened and Priority Ecological Communities Buffers
- Threatened and Priority Ecological Communities Boundaries

(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

Comments Proposal is not at variance to this Principle

The application area occurs within the Murchison Interim Biogeographic Regionalisation of Australia (IBRA) bioregion, in which approximately 99.7% of the pre-European vegetation remains (see table below) (GIS Database; Government of Western Australia, 2013).

The vegetation within the application area has been mapped as Beard vegetation association 2903 (GIS Database). Approximately 96.5% of Beard vegetation association 2903 remains at a state and bioregional level respectively (Government of Western Australia, 2013). Given the amount of vegetation remaining in the local area and bioregion, the 240 hectares of vegetation under application is not considered to be significant as a remnant within an extensively cleared area.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in DPaW Managed Lands
IBRA Bioregion - Murchison	28,120,587	28,044,823	99.7	Least Concern	~7.7
Beard veg assoc. - State					
2903	28,309	27,331	96.5	Least Concern	0.00
Beard veg assoc. - Bioregion					
2903	28,295	27,317	96.5	Least Concern	0.00

* Government of Western Australia (2013)

** Department of Natural Resources and Environment (2002)

Based on the above, the proposed clearing is not at variance to this principle

Methodology Department of Natural Resources and Environment (2002)
Government of Western Australia (2013)
GIS Database:
- IBRA WA (regions - subregions)
- Pre-European Vegetation

(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

Comments Proposal is at variance to this Principle

There are many (>20) mapped minor, non-perennial watercourse watercourses that intersects the application area (GIS Database).

The application area sits within a major watershed and its landscapes are drained by ephemeral drainage tracts (Alexander Holm & Associates, 2015). Densely vegetated groves occur along drainage foci and some areas of vegetation are growing in association with drainage tracts (Alexander Holm & Associates, 2015). It is therefore considered that some of the vegetation under application is growing in association with a watercourse.

Potential impacts to vegetation growing in association with a watercourse as a result of the proposed clearing may be minimised by the implementation of a watercourse management condition.

Based on the above, the proposed clearing is at variance to this Principle.

Methodology Alexander Holm & Associates (2015)
GIS Database:
- Hydrography, linear

(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

Comments Proposal is at variance to this Principle

The application area lies within the Murchison bioregion (GIS Database) which is characterised by its internal drainage, extensive areas of elevated red desert sandplains with minimal dune development and an arid climate. Rainfall events occur throughout the summer months and continue into winter. September to December are the driest months (BOM, 2015).

Six land units were identified within the application area. Of these, two are considered to have at least some vulnerability to erosion (Alexander Holm & Associates, 2015). Erosion is widespread within plains and drainage tracts. Alluvial plains, part of loamy plains with eucalypts and drainage tracts have moderate to high vulnerability to water erosion if vegetative cover is removed. Loamy plains with eucalypt woodlands (land unit 4a) have a slight to high vulnerability to water erosion. Drainage tracts with shrublands or sparse woodlands (land unit 6a) have a moderate to high vulnerability to water erosion (Alexander Holm & Associates, 2015).

Given the size of the proposed clearing and the likelihood of erosion occurring within parts of the application area, it is important to minimise the amount of time the land is left open following clearing. Potential degradation as a result of the proposed clearing may be minimised by the implementation of a staged clearing condition.

Based on the above, the proposed clearing is at variance to this Principle.

Methodology Alexander Holm & Associates (2015)
BOM (2015)

GIS Database:
- IBRA WA (Regions – Sub Regions)
- Soils, statewide

(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

Comments Proposal is not at variance to this Principle

The application area is not located within any conservation area (GIS Database). There are no conservation areas within a 50 km radius. This being considered, the proposed clearing is not likely to provide a significant ecological linkage or facilitate fauna movement in the local area. Therefore the proposed clearing is not likely to impact the environmental values of any conservation areas.

Based on the above, the proposed clearing is not at variance to this Principle.

Methodology GIS Database:
- DEC Tenure

(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

Comments Proposal may be at variance to this Principle

The application area is located within the proclaimed Goldfields groundwater area under the *Rights in Water and Irrigation Act 1914* (GIS Database). Any groundwater extraction and/or taking or diversion of surface water for purposes other than domestic and/or stock watering is subject to licence by the Department of Water. The application area is also located within the Broad Arrow Dam Catchment Area, which is a Public Drinking Water Source Area (PDWSA). The Department of Water has assessed the application to clear native vegetation and has not identified any issues (DoW, 2015).

No major river systems occur within the catchment area (GIS Database; AQ2, 2014) however the application area is intersected by many (>20) minor, non-perennial watercourse (GIS Database). The clearing of native vegetation has the potential to destabilise soils and cause temporary sedimentation to watercourses, thereby impacting on the quality of surface water. Potential impacts to surface water quality as a result of the proposed clearing may be minimised by the implementation of a watercourse management condition.

The majority of the application area has a groundwater salinity that is saline to hypersaline (14000 – 35000 milligrams/Litre Total Dissolved solids) (GIS Database), however the north eastern section of the application area has a groundwater salinity of 3000 – 7000 milligrams/Litre Total Dissolved solids (GIS Database). Regional groundwater flow is to the east, controlled by the surface topography and the Roe Palaeodrainage system. On a local scale, groundwater flow is influenced by the location relative to existing topography and palaeochannel systems (AQ2, 2014). With the annual evaporation rate far exceeding the low annual rainfall (GIS Database; BOM, 2015), there is little opportunity for recharge into regional groundwater systems. Therefore, the proposed clearing is unlikely to cause deterioration in the quality of underground water.

Based on the above, the proposed clearing may be at variance to this Principle.

Methodology AQ2 (2014)
BOM (2015)
DoW (2015)
GIS Database:
- Groundwater Salinity, Statewide
- Hydrography, linear
- Public Drinking Water Source Areas (PDWSAs)
- RIWI Act, Groundwater Areas

(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

Comments Proposal is not likely to be at variance to this Principle

Mean annual rainfall for Kalgoorlie is approximately 267 mm (BoM, 2015). The Murchison region has an arid climate, with rainfall events occur throughout the summer months and continuing into winter. September to December are the driest months (BOM, 2015). Given that rainfall is typically spread out over 8 months, rainfall events are unlikely to result in localised flooding. Therefore the proposed clearing is not likely to increase the incidence or intensity of flooding within the application area or surrounding region.

The application area is located within the Raeside - Ponton catchment area (GIS Database), where there are no major river systems. All streams are ephemeral, flowing only periodically after large rainfall events. Broad, south-east trending drainage systems traverse the region. These drainage systems have very low gradients and contain playa lakes which form local depo-centres with poorly developed radial drainage systems. During occasional intense rainfall events lakes may fill and in very rare events some may overflow (AQ2, 2014).

Given the size of the area to be cleared (240 hectares) in relation to the size of the catchment area (11,596,574 hectares), the proposed clearing is not likely to increase the potential for flooding in this region (GIS Database).

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology AQ2 (2014)
BoM (2015)
GIS Database:
- Hydrographic Catchments – Catchments

Planning instrument, Native Title, Previous EPA decision or other matter.

Comments

There are no native title claims over the application area (GIS Database; DAA, 2015). However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore, the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There is one registered Sites of Aboriginal Significance located in the area applied to clear (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Sites of Aboriginal Significance are damaged through the clearing process.

It is the proponent's responsibility to liaise with the Department of Environment Regulation, the Department of Parks and Wildlife and the Department of Water, to determine whether a Works Approval, Water Licence, Bed and Banks Permit, or any other licences or approvals are required for the proposed works.

The clearing permit application was advertised on 30 March 2015 by the Department of Mines and Petroleum inviting submissions from the public. There were no submissions received.

Methodology DAA (2015)
GIS Database:
- Aboriginal Sites of Significance

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5. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government
DAA	Department of Aboriginal Affairs, Western Australia
DAFWA	Department of Agriculture and Food, Western Australia
DEC	Department of Environment and Conservation, Western Australia (now DPaW and DER)
DER	Department of Environment Regulation, Western Australia
DMP	Department of Mines and Petroleum, Western Australia
DRF	Declared Rare Flora
DotE	Department of the Environment, Australian Government
DoW	Department of Water, Western Australia
DPaW	Department of Parks and Wildlife, Western Australia
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities (now DotE)
EPA	Environmental Protection Authority, Western Australia
EP Act	<i>Environmental Protection Act 1986</i> , Western Australia
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
IBRA	Interim Biogeographic Regionalisation for Australia
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
PEC	Priority Ecological Community, Western Australia
RIWI Act	<i>Rights in Water and Irrigation Act 1914</i> , Western Australia
s.17	Section 17 of <i>the Environment Protection Act 1986</i> , Western Australia
TEC	Threatened Ecological Community

Definitions:

{DPaW (2013) Conservation Codes for Western Australian Flora and Fauna. Department of Parks and Wildlife, Western Australia}:-

T Threatened species:
Specially protected under the *Wildlife Conservation Act 1950*, listed under Schedule 1 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna or the Wildlife Conservation (Rare Flora) Notice for Threatened Flora (which may also be referred to as Declared Rare Flora).

Threatened Fauna and Flora are further recognised by the Department according to their level of threat using IUCN Red List criteria. For example Carnaby's Cockatoo *Calyptorhynchus latirostris* is specially protected under the *Wildlife Conservation Act 1950* as a threatened species with a ranking of Endangered.

Rankings:

CR: Critically Endangered - considered to be facing an extremely high risk of extinction in the wild.

EN: Endangered - considered to be facing a very high risk of extinction in the wild.

VU: Vulnerable - considered to be facing a high risk of extinction in the wild.

X Presumed Extinct species:
Specially protected under the *Wildlife Conservation Act 1950*, listed under Schedule 2 of the Wildlife Conservation (Specially Protected Fauna) Notice for Presumed Extinct Fauna and Wildlife Conservation (Rare Flora) Notice for Presumed Extinct Flora (which may also be referred to as Declared Rare Flora).

IA Migratory birds protected under an international agreement:

Specially protected under the *Wildlife Conservation Act 1950*, listed under Schedule 3 of the Wildlife Conservation (Specially Protected Fauna) Notice.

Birds that are subject to an agreement between governments of Australia and Japan, China and The Republic of Korea relating to the protection of migratory birds and birds in danger of extinction.

S

Other specially protected fauna:

Specially protected under the *Wildlife Conservation Act 1950*, listed under Schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice.

P1

Priority One - Poorly-known species:

Species that are known from one or a few collections or sight records (generally less than five), all on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, Shire, rail reserves and Main Roads WA road, gravel and soil reserves, and active mineral leases and under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes.

P2

Priority Two - Poorly-known species:

Species that are known from one or a few collections or sight records, some of which are on lands not under imminent threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, unallocated Crown land, water reserves, etc. Species may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes.

P3

Priority Three - Poorly-known species:

Species that are known from collections or sight records from several localities not under imminent threat, or from few but widespread localities with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and known threatening processes exist that could affect them.

P4

Priority Four - Rare, Near Threatened and other species in need of monitoring:

- (a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These species are usually represented on conservation lands.
- (b) Near Threatened. Species that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.
- (c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

P5

Priority Five - Conservation Dependent species:

Species that are not threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.